

FINANCIAL INTERMEDIATION: A CONTRIBUTING FACTOR TO ECONOMIC GROWTH AND EMPLOYMENT.

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Abstract

This paper presents an overview of the current issues in economic research on the relationship between financial intermediation, growth and employment with a focus on the macroeconomic aspects. Recent empirical findings show that developments in the financial sector, whether on the saving or lending side, do contribute to economic growth. One of the factors influencing the positive impact of financial sector deepening on growth and employment is the ability of firms to raise capital. Evidence is presented that, at the microeconomic level, access to capital through financial intermediaries can be severely restricted because of market distortions and inherent information problems. Such conclusions inevitably call for the design of targeted financial, monetary and fiscal policies that can improve access to capital by excluded populations.

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Executive Summary

Until recently, financial markets were not seen by the economic theory as directly relevant for development as technological progress and population growth were considered the main driving forces behind growth. Thinking changed with the development of endogenous growth models which state that investment in research and development, in physical capital and in human capital are major determinants of economic growth. Then, naturally, how to finance these investments and how financial intermediaries allocate funds, became the real questions not just for growth but also in terms of distributional effects.

The financial market channels funds across an economy by collecting them from savers and allocating them to investors. Through their actions, financial intermediaries increase efficiency in many ways for example by decreasing leakages in savings, by allowing the development of longer term projects with higher returns or by allowing risk sharing. All these effects have been shown to have a positive impact on growth at the macroeconomic level. Moreover, a large body of empirical findings supports the argument that development in financial development has a positive impact on economic performance in industrialized as well as in developing economies.

In showing that there is a positive causal effect from financial development and long-term economic performance, endogenous growth theories also showed that there is a role for policies. Economic growth is no longer believed to happen for exogenous reasons; instead, governments, through appropriate policies, particularly with regard to financial markets, can influence it. However, macroeconomic studies are unable to provide details about the transmission mechanism between financial development, economic growth, employment creation and poverty alleviation. Nevertheless it is clear that part of the explanation lies in the ability of firms to produce and create jobs. More specifically, factors contributing or hindering enterprise creation and self-employment are expected to play a major role. Among these factors the allocation of talent between wage-employment and entrepreneurship has been shown to have an impact on economic growth. Yet the evidence also shows that self-employment rates remain well below their potential level. Hence, the question is, why are there so many salaried people who would prefer to be entrepreneurs while this has private as well as social costs? The empirical evidence points overwhelmingly toward the financial market as the barrier to self-employment and specifically constraints on access to financial capital.

The allocation of capital is mostly done through rules set by financial intermediaries. In effect, asymmetric information between lenders and borrowers prevent the traditional adjustment between the demand and supply of funds to work through the price system. As a consequence, there is credit rationing for some groups of potential clients. Because of imperfect information, in particular about the borrowers and the risk of failure attached to their projects, financial intermediaries have designed alternative types of contracts to protect themselves against default. A typical loan contract may include the requirement for physical asset as collateral and, would-be entrepreneurs who cannot fulfill the contractual requirements, particularly those who are asset constrained, do not have access to capital from financial intermediaries. Obviously under these circumstances, some categories of people (i.e., young and low-income people, perceived as high risk borrowers) are more likely to be denied access to credit.

Uncertainty about returns and imperfect information about borrowers and their projects plague the financial market. These uncertainties are too costly to be eliminated completely by private agents' action. Despite major developments in the diversity of instruments to hedge risk, mostly in the industrialized financial markets, credit rationing still exists. In developing countries where such sophisticated tools are not available, the expansion of alternative banking schemes does alleviate the problem partially but underserved customers still abound. Hence, for financial development to contribute more effectively to employment and growth in those countries, sound and adequate policies must be developed. A variety of issues must be addressed by a variety of well-designed, targeted policies. Some examples are,

- policies which protect existing customers from moral hazard and non-competitive behaviour by banks such as prudential regulations and competition policies;
- policies that improve access to financial instruments by small or low-income customers who are credit worthy by lowering information as well as transaction costs;
- policies that lower barriers to entry perceived by financial institutions in specific markets such as regulations that induce banks to offer credit and savings services to low income populations;
- monetary policy which does not repress interest rates allows flexibility in discount rate and compulsory reserve ratios, and takes into account the distributional consequences of changes in interest rates through the credit market;
- fiscal policy which does not crowd out private investment;
- capital market policies that take into account the high degree of mobility of capital.

Financial deepening has a positive impact on growth and affects the distribution of income. In the developing world, financial markets are ill-developed and access to credit is widely restricted. Entrepreneurship and self-employment which are effective channels of job creation suffer from severe credit constraint. If modern technology is to be the engine of growth in the least developed countries, access to physical as well as human capital through access to financial services is a necessary priority. While access to credit is not a universal solution to chronic under-employment and unemployment it can go a long way in lightening the burden of other more costly social and employment policies on government budgets.

1. Introduction

Recently the phenomenal development of financial intermediation nationally and internationally has led to a wealth of literature on the interaction between the financial sector and the real sector. In macroeconomics, one of the basic relationships is that foreign plus domestic savings is equal to investment. Traditionally, the neo-classical approach did not question the mechanisms relating savings to investment. However, the development of the literature on asymmetric information and risk in the 1970s led to a growing body of knowledge on the behaviour of financial intermediaries, the credit market and credit rationing in particular (see, for examples, Stiglitz and Weiss, 1981, and Mankiw, 1986).

The financial sector channels funds into savings and from savings into investment. It is quite clear that both can have major implications for economic development. In most markets, efficient allocation is reached through the price system alone as prices are assumed to convey all the necessary information to "clear" the market. The financial market is one exception since prices, that is interest rates, alone do not lead to efficient allocation of capital. This is the case because of financial operations involve risk due in part to informational asymmetries between the lender and the borrower. Hence, higher interest rates that would cover financial institutions for risk, would also price out the creditworthy clients and induce other clients to undertake riskier projects. While the role of prices in the determination of savings and investment should not be undermined, it is clear that, in practice, it is financial intermediaries that mainly determine the allocation of capital by diminishing (but not eliminating) the level of risk through information gathering and special contract designs.

The fact that imperfect information dominates financial markets and that the usual clearing process through prices does not follow also implies that there is scope for government intervention. Historically, policies have aimed at influencing the allocation of resources

(economic regulation) as well as at protecting lenders and savers against risky behaviour (prudential regulation). The balance between efficiency and market regulation is extremely difficult to achieve and not surprisingly, the subject has been extensively researched with major developments in the literature on savings, investment and the real sector. Recently some of the focus has been on the relationship between financial markets and economic growth and it has been shown financial intermediation has an impact on economic growth. These findings revived interest in the potential role of policy in shaping financial intermediation. For example, one of the key issues in the supply of financial services is the cost linked to perceived risk and how financial institutions can protect themselves against default by borrowers. Since risk cannot be fully eliminated and also because the state of macroeconomic environment can increase the perceived risk, the market has been far from good at creating the wide spectrum of financial institutions and services necessary to meet demand. In particular, financial institutions tend to be specialized in services and most of the time, not all segments of the economy and population are seen as attractive. As a consequence, different intermediaries will lead to different financial allocations and income as well as employment distribution effects follow. Also, in the same way the types of institutions matter, the range of services each of them offers does affect the distribution of investments and has consequences for economic growth, poverty and inequality. To minimize the risk of growing inequalities, Western governments, for example, often have intervened with various schemes to induce financial intermediation in neglected areas of activities.¹ As new knowledge about the role of perceived risk grew, so did the interest in policies that compensate for these market imperfections and, the question, how to foster the development of financial intermediation came to the centre of the debate.

¹ Examples of interventions are government guaranteed loans for specific activities or products, subsidies, deposit insurance (see World Bank, 1989 and Stiglitz, 1994, for detailed accounts of the role of the state).

This paper reviews some of the issues relating to financial markets and the real sector. It is far from an exhaustive survey of all the existing literature but it is an attempt to clarify the role of financial intermediation in contributing to growth and employment. Section 2 offers a brief overview of the macroeconomic issues regarding the role of savings and financial intermediation in economic growth. In Section 3, the literature on obstacles to employment creation and the key role of restriction on access to credit is presented. Section 4 derives some broad policy implications and Section 5, concludes with some comments in relation to the ILO employment agenda.

2. The Macroeconomics of Growth, Employment and Financial Markets

The level of output produced by industrial economies, when measured over several decades, trends upward even when population growth is taken into account. The theories of economic growth concentrate on identifying the mechanisms underlying that trend.² Understanding the factors generating this positive trend is important in particular if policies can be shown to play a role in shaping it as it has been argued that policies that create growth are usually not fundamentally different from those, which benefit the poor.³ Typically, economic growth has been analyzed within the macroeconomic framework where there is an obvious link between investment, savings and national production. During the past twenty years, these theories have evolved significantly, moving away from the view that growth is exogenously determined and therefore governments cannot influence it to the view that economic growth much depends on the quantity and the quality of national factors and, thus,

² This is different from disequilibrium theories which concentrate on explaining the short-term deviations from the trend or the business cycle.

³ A recent debate has focused on the validity of this statement and, in particular, on the relationship between growth, poverty and inequality (see, Rodrik, 2000, for a non-technical short overview and Ray, 1998, chapter 7).

institutions and policies matter. This section offers a brief review of this evolution in the theories with an emphasis on those, which have implications for financial markets.⁴

2.1 The Solow Growth Model

One of the earliest models of economic growth was developed in Solow (1956). Economic growth is measured by a steady positive increase total output produced by a country, and at the theoretical level it is approximated by an aggregate production function. Solow's model is set in a neo-classical framework where it is assumed that all prices have adjusted to clear all the markets (i.e., supply is equal to demand) and incentives have generated efficient outcomes. The model is consistent with long-term adjustments having fully taken place. In the simplest form, three factors determine aggregate output: labour, capital and technology.⁵ Growth models concentrate on explaining the behaviour of *potential* output, that is output achieved with a given technology and the full employment use of other factors.⁶ Naturally, they focus on the effects, over time, of changes in labour, capital and technology. Next, each factor is considered in turns.

Changes in labour can be induced by changes in the population or in the proportion of the people available for work, namely the participation rate. Changes in existing productive capital depend on net investment that is gross investment minus depreciation of existing capital. As long as net investment is positive, capital grows and production growth follows. However, the size of investment matters. It can be so small that the induced change in capital is marginal and so is the effect on production. Finally, technology combines the other inputs, labour and capital, to produce output. Hence, in the absence of changes in one of the two

⁴ This section borrows heavily from Agénor and Montiel (1999) and Ray (1998).

⁵ The production function for aggregate output (Y) is then represented as $Y=F(A,K,L)$ with A for technology, K for capital and L for labor. The rate of growth is defined as the percent change in output such that, $\%Y/Y=g_y$.

⁶ Note that full employment of factor does not mean capital is used at 100% capacity and there is no unemployed person. Full employment is achieved when measured unemployment is equal to the natural rate and capital utilization rate is around 90-95%.

inputs, growth is assumed to come from change in technology. A "better" technology is one that increases total factor productivity that is increases production with a constant amount of inputs used. Technological changes can take several forms: existing technologies are improved or new technologies appear (improved communications); the organization of work changes (sequence of tasks, learning by doing); the quality and/or composition of inputs and/or outputs changes (increased education level in workforce, move from production of clothing to computers).

Concretely, the Solow growth model is based on an aggregate production function, which exhibits constant returns to scale and diminishing marginal returns. As a consequence, output per worker ($y=Y/L$) depends only on capital per worker ($k=K/L$), such that,

$$(1) \quad y = Ak^a, \quad 0 < a < 1.$$

What are the forces that generate output growth in such framework? Following (1), for output per worker to change, the ratio of capital per worker must change.⁷ This will happen if capital accumulation is larger than labour force growth that is if capital grows faster than labour and k increases. In other words, if the accumulation of capital is larger than what is necessary to provide each new worker with the quantity of capital existing workers have, the ratio will increase. In this model, financial markets do not explicitly enter the picture. Nevertheless, in the macroeconomic framework, *gross* capital accumulation is equal to investment and, in a closed economy, investment is equal to domestic saving. Hence, savings in the economy feeds into investment and *net* capital accumulation (\dot{k}), or the change in capital that will contribute to production growth, is defined as total saving (sy) minus compensation for labour force growth (nk). As a result, growth in capital (\dot{k}) and growth in

⁷ The technical steps of the model are developed in Appendix I.

output (g_y) are defined as,

$$(2) \quad g_k = sAk^{a-1} - n \quad \text{and} \quad g_y = \alpha g_k.$$

where n is the rate of growth of population.

The main feature of Solow's model is that in the long run, after all adjustments have taken place, total saving is used to make capital grow exactly at the same rate as population. Each new worker gets the same capital as existing workers and capital per worker is constant ($g_k=0$). Alternatively, it can be said that the rate of growth of capital and labour converge to the same value ($sAk^{a-1}=n$) and there is a steady-state value of the capital labour ratio. In Solow's model, in the long run, once the level of capital per worker is stabilized, output per worker is stabilized and both, capital and output grow at the same rate. This is known as the balanced growth argument.

From the viewpoint of the role of the financial sector, the surprising implication of this model is that in the long run, the rate of growth of output per worker is equal to that of the labour force, regardless of the savings rate. Hence, improvements in the collection of savings or financial innovations that stimulate savings have no effect on economic *growth*. There is a transition period during which the difference between capital growth and labour growth is positive and thus, capital per worker and output per worker rise. But, the phenomenon is temporary and eventually, the steady state prevails as k and y reach a new constant level. Therefore, the savings rate affects permanently the *level* of output, not its growth rate.

Finally, in the case of an open economy, some of the increase in capital can be financed by foreign saving through capital inflow and current account deficit. The opening up of the economy will put it on a temporary adjustment path if the domestic interest rate is not equal to the world interest rate and investment (or dis-investment) will take place. Once the capital per worker ratio is such that interest rates are equalized, the economy will resume its

growth at the labour force rate, n , with a current account disequilibrium and a level of capital flows just necessary to maintain the new capital labour ratio.

The Solow growth model has been used extensively as a basis for empirical investigations on the sources of growth. Many studies focus on the role of technological changes, the so-called TFP calculation (Total Factor Productivity calculation). The following formula can be derived from Solow's model,

$$(4) \quad g_y = g_A + a_K g_K + a_L g_L.$$

Total output growth rate is a weighted average of the growth rates of the three factors: capital (g_K), labour (g_L) and technology (g_A). This equality is known as the growth accounting framework or the source of growth methodology. Even if an economy has not reached the steady state (i.e., is not in balanced growth), it is possible to determine the contribution of labour, capital and technical changes to economic growth. In industrial countries 70% of growth is attributed to labour ($a_L=0.7$), 30% to capital ($a_K=0.3$). The residual growth is due to technology. Hence, for given values of the capital and labour growth rates, it is possible to evaluate the non-measurable contribution of technology. It must be noted that this methodology has been used for developing countries with mixed results.⁸

To summarize the major outcomes of the Solow growth model is that only continuous exogenous shocks can generate sustained growth. Hence, only continuous technological shocks or changes in demographic factors can affect growth. There is no growth in steady state, which implies that there is no mechanism for government policies or savings to influence the growth process. These predictions tend to go against the evidence, which suggest that fast growing developing economies have higher savings rates than middle and

⁸ There are two problems: First, the methodology implies competition and constant returns to scale (i.e., $a_K = (1-a_L)$) which are not necessarily suitable assumptions for developing economies. Second, the size of the residuals, i.e., the technological contribution to growth, depends very much on the measurement of the other factors (see Agénor and Montiel, 1999, chapter 17, and Ray, 1998, chapter 4, for more details).

low growth countries. As illustrated by Figure 1, there is an apparent positive correlation between savings rate and growth rate and some inconsistencies between the theory and empirical facts remain.

[Insert Figure 1, end of document]

These inconsistencies have been at the root of the fast development of the endogenous growth theory, which is able to reconcile changes in savings rate and economic growth.

2.2. Endogenous Growth Theory

In the Solow model growth can arise only through continuous changes in technology and therefore is purely exogenous. Savings by itself does not generate growth. One recent avenue of research has been to question the relevance of the exogeneity assumption in the Solow model.⁹ Two broad approaches have been developed, one that sees all inputs as reproducible and the other that is based on externalities. In one particular case the externalities takes the form of human capital building. In both approaches, the savings rate plays a key role in the growth of capital and output per worker.

The first approach is the so-called AK-model (see Rebelo, 1991). It is based on the hypothesis that all input are reproducible and in particular the state of knowledge through research and development. Therefore, the diminishing marginal productivity of capital, which in the neo-classical model leads to constant steady state values of capital and output per worker, is here compensated by an increasing quality of machinery.¹⁰ It can be then shown that using the same investment and saving hypotheses as in the neo-classical model, the steady state rate of growth of capital per worker in the AK-model is,

$$(5) \quad g_y = g_k = sA - n,$$

⁹ See Bernanke and Gürkaynak (2001) for a formal testing of the relevance of the hypothesis that growth is exogenous.

¹⁰ See Appendix A.2. for further technical developments.

which implies that, for constant savings rate and population growth, if $sA > n$, capital per worker can grow without bound. Moreover, an increase in the savings rate permanently raises the rate of growth of capital and output per worker.

The second approach introduces externalities in the production process such that an increase in the output level by one firm affects positively factor productivity in another firm. Not all types of externalities are, however, necessarily linked to the production process and one type of externalities which is of particular interest concerns labour (see, Lucas, 1988 and Mankiw et al. 1992). In this model, labour is endogenously determined and it is not just the quantity of labour, which is relevant, but its "quality". Households can save by investing in human capital in addition to saving to invest in physical capital (see Appendix A.3. for details). In doing so, households produce labour with skills, labour that can create ideas and handle sophisticated technologies. The theoretical set-up is very similar to that of the Solow model but with human capital deliberately accumulated (i.e., endogenous). Production per worker can be represented by,

$$(6) \quad y = k^a h^{1-a},$$

where y and k are the same as in the Solow model that is output and capital per worker and h is human capital per worker. In Solow's model, the quantity of labour available to the economy is determined by population growth and there is no quality of skill effect. In this model, output is consumed and saved as before except that there are two ways to save.¹¹ A fraction s is saved for capital accumulation ($\dot{k}=sy$) as before and another fraction q is saved to increase human capital quality ($\dot{h}=qy$). In that case, in steady state, y , k and h grow at the same rate which is determined by the two savings rates such that,

$$(7) \quad g_k = s^a q^{1-a} = g_y.$$

¹¹ Population is assumed to be constant here to clearly isolate the effect of endogenous labor.

The major implication of this equation is that both savings rates have growth rate effects and not just level effects. As a consequence, growth is no longer determined by arbitrary technological changes but it is endogenous and determined by decision to invest in physical or human capital. Clearly, this conclusion leaves room for policies that stimulate savings in either factor of production to affect the growth of the economy. As an illustration, Robertson (2000) for example evaluates the trade off between policies that stimulate human capital building and policies that improve the productivity of physical capital in developing economies.

The major conclusions that can be drawn from growth models with no explicit modeling of the financial sector can be summarized as follows:

- The neo-classical theory of growth (i.e., the Solow growth model) shows that the savings rate has an effect on the level of capital per worker but not on its growth rate. An increase in savings generates accumulation of capital temporarily until a new steady state level of capital per worker is reached. Then savings reverts to its role of providing capital for the new workers in every period on the basis of the existing capital/labour ratio.
- The AK-model of endogenous growth states that if improvement in the quality of capital through research and development can compensate for decreasing marginal returns of capital, the savings rate will affect the growth rate also in steady state.
- The growth model with endogenous labour and skill determination postulates that two types of savings matter for growth: saving for investment in physical capital and saving for investment in human capital. An increase in any of the two savings rates will increase the growth rate of per capita output.

Hence, without introducing financial markets explicitly, there are grounds to believe that incentives for the population to save and more efficient channelling of saving can affect growth.

The latest developments in endogenous growth literature have shown how financial intermediaries also affect the growth process directly. The next section reviews briefly the model with the explicit introduction of financial intermediation and the consequences it has for economic growth.

2.3. Financial Intermediation and Economic Growth

The growth models described in the preceding section do not have financial intermediation explicitly modeled. It is simply stated that the share of aggregate output saved by the economy is available for investment. Such assumption is equivalent to having perfect, costless financial intermediation between the agents with a surplus of funds and those with a deficit of funds. While it is true that financial intermediation does increase the transfer of funds across agents it is certainly not costless and several types of leakages can occur between savers and investors. Therefore, the presence of financial intermediaries helps improve efficiency in the distribution of capital but not at zero cost.

Capital market transactions are affected by three categories of problems: uncertainty, information asymmetries and transaction costs. All three can be linked back to information that prices are unable to reflect. However, financial intermediation can reduce some of the inefficiencies resulting from these three sources of imperfect information. First, uncertainty in financial transactions arises on the supply-side of funds through capital allocation and on the demand-side of funds through risk allocation. Economies of scales allow financial intermediaries to gather information and decrease uncertainty at a relatively low cost. Second,

asymmetric information concerns the fact that private information is costly to obtain. Financial intermediaries can set-up special arrangements and contracts, such as the collateralization of credit, to generate the correct incentives. Third, other transaction costs are reduced by financial institutions, which can intermediate between a large number of small savers and big borrowers for example. The remaining of this section offers a summary of the rapidly growing literature on the role of financial intermediation in the determination of growth.¹²

In the context of the AK-model developed in section 2.3., it can be assumed that a proportion of savings $(1-f)$ is lost such that only fsY is available for investment. Then, it can be shown that the growth rate of capital and output is,

$$(8) \quad g_k = g_y = \mathbf{j} sA - n.$$

This equation differs from equation (5) by the fact that only a fraction f of collected savings contributes to the growth rate of capital and output per worker. Hence, the introduction of costly financial intermediation in the endogenous growth model, leads to a direct effect on the growth rates as only savings collected through financial intermediaries matters. At least two other less obvious effects also happen with the explicit introduction of financial intermediaries: Financial sector development affects the social marginal productivity of capital, A , and the savings rate, s . The channels through which these three effects work are developed below.¹³

It is clear from equation (8) that the higher the leakage $(1-f)$, the smaller the growth rates (g_k, g_y) . The direct loss of savings through leakages can be attributed to several factors. It usually corresponds to the actual cost of financial intermediation by banks. However, it can also be absorbed by financial institutions in the form of X-inefficiencies or rents from market

¹² This section is inspired from Agénor and Montiel (1999) chapter 19, Pagano (1993) and Levine (1997).

¹³ Levine (1997) provides an extensive survey of the theoretical literature underpinning these points.

power and oligopolistic behaviour. Finally, leakages occur when taxes collected by the government are spent on consumption goods rather than investment goods since in the macroeconomic equilibrium, public and private saving is equal to total investment.

The relationship between financial intermediation and the marginal productivity of capital arises because the presence of financial intermediaries allow for investments into higher return projects. It is, for example, the case because some high return projects are also long-term projects and require long-term commitment from investors. Savers, however, tend to prefer liquid investments, that is investments they can disengage from quickly in case of unexpected circumstances. This type of mismatch in liquidity preferences may prevent major investments from taking place because there is no possibility to foresee the needs of savers for liquid assets. Banks, for example, alleviate the problem because they can offer demand deposits to savers and invest in a mixture of short and long-term investments thereby satisfying the demand for short-term deposits and for high return investments. Another example is the stock market where individual equity holders can sell shares on very short notice and firms have permanent access to the capital initially raised. Because some technologies have long gestation period and require transfer of ownership, transaction costs on the secondary market affect production decision and, thus, the rate of growth. Because transaction costs tend to fall on the stock market as it develops, the liquidity risk decreases and more illiquid projects can be funded. In all cases, if long-term projects generate sufficient externalities (as in the AK-model to compensate for decreasing marginal productivity of capital), steady-state growth will be enhanced.¹⁴

¹⁴ It has been argued that the development of financial intermediaries which mitigate the liquidity risk by offering savers assets they can sell quickly and investors funds for the longer term has been at the source of the industrial revolution (Bencivega et al., 1995, Hicks, 1969). Also, the paper by Bekaert et. al.(2001) addresses several of the issues related to the effect on investment in the context of financial sector liberalization and growth.

The relationship between financial intermediation and the savings rate is much less straightforward and the effect on the rate of growth of output per worker is ambiguous. There are two aspects to consider in relation to the savings rate: First, for given available instruments, the decision of households to change their savings rate and second, the efficiency with which the system mobilizes savings. Starting with the impact of financial developments on the incentive to save, McKinnon (1973) predicts that the end of financial repression leads to a rise in interest rates, which is likely to increase savings. Empirical evidence, however, is far from being unanimously supportive of a positive relationship between the real interest rate and savings. The reason is that financial development can decrease the savings rate through risk sharing. As it has just been seen, financial market intermediaries, by allowing the diversification of risk, lower uncertainty for savers and they may decide to lower their overall savings rate. Also, if the choice of financial instruments expands, savings can decline. For example, the development of the insurance market, which protects households against some contingencies, could decrease the need for precautionary savings. Similarly, access to consumer credit and a mortgage market can have an adverse effect on savings. Hence, through financial developments, the savings rate could fall enough that the improved capital allocation toward high return long-term projects would no longer compensate and generate higher growth rates.

Second, the ability of the system to mobilize and channel savings is crucial for growth. Different production processes require different scales of production and without access to a large number of small investors, some production processes could never take place. Hence, efficiency in production requires the pooling of savers and the existence of small denomination instruments to allow savers to diversify (Sirri and Tufano, 1995). However, there are transaction and information costs to mobilizing small savings and it requires diversified legal and financial intermediaries as well as diversified instruments. Efficient

savings mobilization can therefore greatly improve resource allocation and boost economic growth.¹⁵

There are a number of parables that can illustrate the functions that the financial market play (see Levine, 1997, Section 2.G) but a more compact illustration of the main functions of financial intermediaries is given in Figure 2.

[Insert Figure 2, see end of document]

Jenny is a typical entrepreneur who has an idea to improve some production process. To materialize her idea she needs capital. She has some saving but not enough to finance her venture and, in any case, she does not intend to put all her eggs in the same basket. Like any rational investor she wants to diversify the use of her savings in terms of liquidity and risk. She, therefore, needs to enter a relationship with some financial institution for several reasons: First, to engage in risk and liquidity diversification through access to various types of investments in terms of maturity length and in terms of sector- or firm-specific risk level. Second, she needs other people's saving to finance her venture and financial intermediaries pool the saving of many small clients (including hers). Clearly to get financial intermediaries' cooperation she will have to provide information to the institution about her project and accept monitoring of her enterprise's performance. Finally, financial institutions will want to diversify their investments and thus, used the pooled savings to finance projects of various maturity length and risk level. In the absence of intermediation, Jenny would have to save enough to finance her venture (or find enough funds through friends and family) and invest in a single project, bearing all the risk but minimizing transaction costs.¹⁶ Then, as Figure 2 shows, in a world of imperfect information, financial intermediaries will arise to improve efficiency in funds collection and allocation and decrease risk.

¹⁵ There are other financial sector functions that can affect growth through capital accumulation or savings such as corporate control, promotion of specialization and technological innovation (see Levine, 1997).

¹⁶ See also World Bank (1989), chapter 2, for an excellent description of the trade off between endogenizing risk and the transaction costs.

At this time, there is no theory of why or what types of financial intermediaries arise, but it is easy to see that they can contribute to improving economic growth in several ways. In the absence of theory, empirical testing is more hazardous. However, a number of studies have investigated the relationship between economic growth and financial depth and the majority of evidence support a stimulating role for financial intermediaries in growth.

The basic empirical test is whether financial development or "financial deepening" has a positive effect on economic growth when other factors are controlled for. There is, of course, the seminal work by Goldsmith (1969) and the book by McKinnon (1973) and two of the most comprehensive studies are King and Levine (1993a, 1993b). Goldsmith investigates 35 countries from 1860 to 1963. From its rather small country sample he finds a positive relationship between the size of financial intermediaries and growth but his study suffers from some shortcomings. For example, it does not identify the direction of the causality only that there is a positive relationship between the two variables. In effect, financial deepening may contribute to economic growth but it is clear that economic growth can generate financial development. The study does not control for other factors than can affect growth and only the size of financial intermediaries is taken into account, not their efficiency. McKinnon takes a different route by studying the mass of evidence from country studies (Argentina, Brazil, Chile, Germany, Korea, Indonesia and Taiwan) during the post World War II period. He concludes that better functioning financial market lead to faster growth. However, country studies do provide contradictory results and there is disagreement in the literature. In their studies, King and Levine address the problems attached to Goldsmith (1969). They use four different measures for financial deepening to examine to what extent financial development contributed to long-term economic growth in seventy-seven countries during the period 1960-1989 while controlling for factors such as education, political stability, trade, monetary and fiscal policy. All the results indicate a strong and highly significant contribution of financial

sector development to economic growth, physical capital accumulation and economic efficiency. Also, in their studies, King and Levine show that reverse causation can be excluded by using the initial level of financial development to predict the growth-related variables. There are numerous other studies on this issue and many are reviewed in Levine (1997)¹⁷. Overall, the majority of evidence favours the argument that financial development can alter economic growth.

To summarize, while theoretical models cannot provide a complete and unambiguous response to the question of the impact of financial sector development on economic growth, empirical studies overwhelmingly support the argument that better financial intermediation has a positive impact on the economic performance.

Generally, the question of economic growth has been studied at the macroeconomic level, both theoretically and empirically. However, as a macroeconomic phenomenon it has microeconomic foundations, as Figure 2 shows. Economic growth and employment growth arise as a consequence of entrepreneurial activities and thus, it is appropriate to think about the role of financial intermediaries at the individual level. The following section outlines briefly the main concerns arising from the microeconomic approach to financial intermediation.

3. The Microeconomics of Growth, Employment and Financial Markets

Before presenting the evidence on financial obstacles to job creation, something must be said about the link between output growth and employment growth. It is not easy to identify that link mostly because of the nature of the capital/labour ratio. Firms have business plans that involve decisions about technology (i.e., capital) and labour uses, based on the

¹⁷ Additional more recent studies are referenced in Khan and Senhadji (2000).

relative price of the factors, on government policies and on the overall economic environment. Hence, many combinations of capital and labour can be at the source of a given growth in output and no stable relationship can be relied upon to quantify job creation at the macroeconomic level. In that sense, despite major progress made recently in theory, the analysis of economic growth still remains a black box.

Nevertheless, it is clear that firms and new firms in particular create employment and anything hindering the expansion and creation of firms will affect job creation adversely.¹⁸ Note that for our purpose, the distinction between existing and new firms is important since presumably existing firms have a history of dealings with financial intermediaries while new firms may not. Recently some of the focus in employment research has been on the nature of the job creation/destruction flows in Western economies, and particularly in the U.S., during the expansion that spanned through most of the 1990s.¹⁹ Regarding job creation by new firms, one of the findings is that in 1995-1996, in the U.S., more than 1/3 of the jobs were created through the birth of new establishments (Bednarzik, 2000). Even though data are less easily available and the expansion was not as spectacular as in the U.S., European countries seem to show similar patterns. Also, Berry (1997) argues that small-scale enterprises can make an important contribution to job creation for relatively low-income workers and thereby to poverty alleviation in developing countries. In conclusion even though in absolute numbers, job expansion in existing firms is still larger than job creation by new firms, there is no question that entrepreneurial activity is an engine for employment creation. Hence a closer look at entrepreneurship is necessary.

While entrepreneurship and self-employment are two different concepts, the mechanisms driving the decision to be self-employed is at the heart of the process of firms'

¹⁸ Figure 2 illustrates clearly that economic growth is anchored in the behaviour of the individual firm. In fact, from the technical viewpoint, the aggregate production function used in growth analyses, mirrors the production function of a typical firm, which by combining technology, capital and labour in an imperfect world with frictions generates output.

¹⁹ See Davis et. al. (1997), Bednarzik (2000), for specific results and Gross (2001) for a survey of this issue.

birth. Hence, self-employment can be expected to play a role in job creation and growth. In Figure 3, there is a clear positive correlation between the share of self-employed and economic growth for a sample of 35 countries.²⁰

[Insert Figure 3, end of document]

Naturally, a positive correlation does not imply causality from self-employment to real growth. In fact, Folster (2000) shows that in Sweden, between 1976 and 1995, self-employment may have had a positive effect on overall employment. He finds that the total number of jobs may have increased when a person moved from wage-employment to self-employment. Yet recent observations in the literature have been that despite the expansion of self-employment in most Western countries (Quinlan, 1998), a large number of people who are currently working in paid employment, express a preference for self-employment. In effect, 63% of American, 48% of Britons and 49% of Germans belong to that category (see Blanchflower and Oswald, 1998, p.27). So, despite the rise in self-employment, there are still large numbers of people who do not realize their wishes. Then two questions arise: First, does it really matter that people are wage-employed rather than self-employed for job creation? Second, if it matters, what make people choose to stay in paid employment rather than become self-employed?

The answer to the first question is, yes, it does matter (see Lucas, 1978, Baumol, 1990, and Murphy et. al., 1991 for examples). This stream of the literature argues that is it not only investment in knowledge that has an impact on economic growth but also the allocation of talent across activities. Murphy et. al. (1991) show theoretically and empirically that "Which activities the most talented people choose can have significant effects on the allocation of resources. When talented people become entrepreneurs, they improve technology (...) and as

²⁰ The countries are: Argentina, Australia, Austria, Bolivia, Canada, Chile, Costa Rica, Denmark, Ecuador, Finland, France, Greece, Hong Kong, Hungary, Ireland, Israel, Italy, Japan, Rep. of Korea, Mexico, New Zealand, Norway, Panama, Paraguay, Philippines, Portugal, Singapore, Spain, Sri Lanka, Thailand, Trinidad and Tobago, Turkey, Uganda, United Kingdom, Venezuela.

a result, productivity and income grow." (p.505). Clearly this type of reasoning belongs to the arguments underlying the endogenous growth theory presented in section 2. The factor of production called "labour" has a direct effect on technology and conversely thereby generating growth endogenously rather than relying on external shocks.

Then, if entrepreneurship and the allocation of talented people to entrepreneurship are good for growth, what prevents this from happening? A look into the factor influencing the decision to become an entrepreneur shows that there are two major types. The first type is related to market failure through (Knight, 1921, Kirzner, 1973, Evans and Jovanovic, 1989) and the second one is about particular individual characteristics such as managerial talent or risk aversion (see for examples, Lucas, 1978, Kihlstrom and Laffont, 1979). We shall concentrate on the first type of factors since the argument of uncertainty leads naturally to the existence of capital constraints. In short, entrepreneurs do not have direct access to the necessary capital, because uncertainty is such that, for various reasons, their business opportunities cannot be assigned probabilities of success or failure. As bankers face unknown probabilities, they offer only secure loans with stringent conditions that would-be entrepreneurs may not be able to meet. Then capital constraints are limiting self-employment and new firms development. In that case, unlike with other types of factors, attitude toward risk is not central to the determination of who becomes an entrepreneur but personal credibility or wealth is. Given the existing economic circumstances in developing countries (i.e., very low probability of paid employment, hence, low expected return for that alternative, and wide spread unemployment) it can be safely argued that constraints on access to capital are likely to be even more binding. While most of the research has been done for industrialized countries, the results can still be of interest for developing economies.

To test the asset constraint argument, two approaches have been taken in empirical studies. The study of the impact of assets can be done either on the already self-employed or

on the transition from paid employment to self-employment. Blanchflower and Oswald (1998), study the consequences of capital constraint on a sample of individuals running their own business. Their conclusions are that the receipt of an inheritance or gift (typical unconditional access to capital) seems to increase the probability of being self-employed especially for young people. Most small businesses were started with own or family money and psychology does not play a key role in determining who becomes an entrepreneur. Also, Holtz-Eakin et al. (1994a) show that self-employed individuals who receive inheritance within 4 years are more likely to succeed in their business. And Bates (1990) finds that firms with large amounts of start-up capital are less likely to fail. This result is confirmed by Crowley and Bainton (2000) who find that "Raising sufficient finance is of major importance if businesses are to survive the start-up stage" (see Section 3.3., p. 134) in their study of the survival of businesses started by unemployed and low-income people in the U.K..

Other studies rather than looking at the already self-employed, use longitudinal datasets and look at the individual characteristics influencing the switch from employment to self-employment (see for examples, Holtz-Eakin et al., 1994b, Evans and Jovanovic, 1989, Evans and Leighton, 1989, Fuchs, 1982). When asset is part of the characteristics, it is significant and positive in the transition rate. Hence, whether one looks at the self-employed or at the transition to self-employment, the level of assets plays a significant role and the evidence suggest that financial constraints are an impediment to entrepreneurship.

Some analyses have been carried on more disaggregated data to investigate the role of assets across population groups and particularly racial groups in the United States (see for examples, Fairlie and Meyer, 1996, and Fairlies, 1999). The difference in the proportions of black and white self-employed in that country is striking: 4.6% and 15.2% respectively, on average for adult men, between 1968 and 1989 (Fairlies, 1999, Table 1). The results show that racial differences in levels of financial capital partly explain the difference in self-

employment rates and entry rates into self-employment. Also, Bates (1989) shows that lower levels of financial capital for blacks contributes to their higher business failure rate. Theoretically and empirically, constraints on financial capital have been shown to hinder the development of entrepreneurship when other characteristics, like individual characteristics, are controlled for. The argument holds when the test is done on existing self-employed or on the decision to transit from paid employment to self-employment.

The evidence overwhelmingly shows that financial asset availability is a binding constraint for entering self-employment and many job creation opportunities are lost due to a lack of access to starting capital. Even though such argument is supported mostly by evidence from industrialized countries, it is not irrelevant for developing economies for the following reason. Most developing countries suffer from partially developed and ill-functioning financial markets where a large proportion of the population does not have access to any kind of financial services. The underlying reasons can be partly institutional (i.e., lack of well-established property rights²¹) but a strong argument can be made about the role of asymmetric information problems and the lack of collateral, i.e., the so-called financial asset constraint. The models are based on expected income in both states, wage-employed and self-employed, and it is fair to assume that when the transition is from unemployment or very low level of self-sufficiency, as it is the case in developing countries, to self-employment, assets would play an even more important role.

The next section offers some policy suggestions to alleviate the impact of financial constraints and ensure more developed financial intermediation.

²¹ De Soto (2000, 2001), for example, argues that poor households in developing countries do own assets but ill-established property rights prevent these assets from being recognized as valid collaterals by financial intermediaries.

4. Policies for Finance and Growth

Ever since the development of economic theories about imperfect information and risk, the financial market has been seen as one market not adjusting through the price mechanism. In fact, the allocation of capital is mostly done by credit institutions. Under those conditions it is clear that commercial banking will address only some of the financial needs of a widely heterogeneous population. Consequently there will be a skewed allocation of investments whether in sizes, sectors or industries. During the past twenty years, western economies have witnessed a wide expansion of the spectrum of financial market instruments. That development was in part triggered by the demand for investments and in particular changes in capital needs from entrepreneurs in the new technology sector. In fact, today, it is much easier for a young entrepreneur to develop a "start-up" than it was, even for Bill Gates. Also, a wide spectrum of new instruments has attracted the average saver to the stock market. These developments undoubtedly have provided potential self-employed with better access to capital, at least in some sectors. However, the savings and loan debacle in the U.S. is also a reminder that things can go very wrong even in a highly developed and sophisticated financial sector.

Financial sectors in developing countries are far from reaching this level of access to capital. This is in part the case because uncertainty and asymmetric information are too costly to be completely eliminated by private agents such as lenders and borrowers. In recent years, access to financial markets by average households in Western countries was improved also because of relevant policies and regulations were put in place. Hence, it is quite clear that for financial development to contribute even more effectively to growth, employment and poverty alleviation, sound and adequate policies must be developed. A variety of issues

affecting the financial market directly or indirectly must be addressed by a variety of well-designed policies:

- Policies which protect existing customers from moral hazard such as prudential regulations and from non-competitive behaviour by banks such as anti-trust legislation.
- Policies that improve access to financial instruments by small or low- income customers who are credit worthy. A famous illustration of the effectiveness of such policy is Federal Express, which started operation with the help of the small business loan program of the U.S. government.
- Policies that lower the barriers to entry that financial institutions perceive in some markets such as regulations that induce banks to award loans in areas where they collect savings.
- Monetary policy which does not repress interest rates allows flexibility in discount rate and compulsory reserve ratios, and takes into account the distributional consequences of changes in interest rates through the credit market.
- Fiscal policy which does not crowd out private investment.
- Capital market policies that take into account the relative degree of mobility of capital and their destabilizing effects on financial markets (see Stiglitz, 2001).

from the above list, it is clear financial intermediaries' behaviour can be affected by direct institutional policies such as prudential regulations as well as by a variety of macroeconomic policies that changes agents' incentives by changing interest rates or tax rates. But all these categories of policies will change the structure of the financial services and thus, investment potential and employment creation. Note that because of the heterogeneity of financial needs

and the variety of institutions offering services, it is quite clear that a policy suitable for one type of financial institutions is not necessarily suitable for all types of financial institutions. Hence, a partial equilibrium approach with targeted policies is more desirable than a blanket approach.

5. Conclusion

Recent developments in macroeconomic theory have shown that financial intermediation influences not only for the level of production per worker in a country but its long-run rate of growth. By solving some of the transaction costs and information problems between savers and investors, financial instruments allow for a more efficient allocation of investments. Moreover, empirical studies have shown repeatedly that financial development positively causes economic growth. These macro results while not explaining why financial intermediaries arise, and what types of intermediaries are optimal, clearly show that financial institutions are necessary for the long-run development of an economy.

The fact that savings and financial intermediation have long-run effects on the expansion of the real sector, measured by output and employment, has major policy implications. It has been shown extensively that asset constraint and lack of access to capital hinder the development of self-employment. In effect, because of imperfect information, financial allocation cannot be achieved through the price mechanism and credit rationing follows when some potential clients are perceived as risky or too costly by suppliers of traditional financial services. As a result, financial intermediaries set the rules for the collection and the allocation of funds thereby influencing the structure of investments, the level of job creation and the distribution of income. Thus, to fully realize the employment and growth potential of financial intermediation, it is necessary to develop a wide spectrum of

types of institutions and instruments so that segments of the population who are rationed out by commercial banking, have access to capital. Such institution variety is sustainable only if appropriate policies and regulations that aim at decreasing the perceived risk by savers and borrowers alike are implemented.

Comprehensive, well functioning financial markets are necessary to fully develop the job creation potential of economies whether in the Western world by improving work perspectives of the unemployed for example or in the developing countries, by expanding self-employment and small enterprise creation. If modern technology is to be the engine of development, access to capital is a priority for the financing of physical capital as well as human capital formation to allow for the implementation of those technologies. To reach that goal, incentives and regulations that lead to sustainable financial intermediaries offering a wide variety of services and instruments must be developed. Within an environment of macroeconomic stability and good governance, a well-developed financial sector will put an economy on a path that produces jobs and better standard of living.

Nevertheless, the evidence shows that not every single individual will be served even under the most comprehensive financial sector. Financial intermediaries, whatever their form, will always perceive some individuals as too risky either in terms of involuntary default (inability to repay) or in terms of strategic default (unwillingness to repay). Thus, in a world where costs and sustainability matter, even in the long run, some individuals may never be eligible for financial services. There is, however, a long way to go before reaching that state and access to financial services can continue to alleviate poverty and foster self-employment for low-income people in all parts of the world and policies that enhance financial intermediation directly or indirectly should be encouraged. This is also the only way to lighten the burden of more costly social and employment policies on government budgets.

Appendix: Growth Models

A.1. The neo-classical framework

It assumes that a closed economy can be represented by an aggregate production function with technology exhibiting constant returns to scale. Capital and labour have diminishing returns and technology undergoes exogenous shocks. Formally, these assumptions can be represented by a Cobb-Douglas production function for the economy, such that,

$$(1) \quad Y = AK^a L^{1-a} \quad 0 < a < 1$$

Output per worker ($y=Y/L$) then depends only on capital per worker ($k=K/L$), as

$$(2) \quad y \equiv Y / L = A(K / L)^a \equiv Ak^a,$$

For output per worker to change, capital per worker must change. Gross capital accumulation is equal to saving in a closed economy ($I=S$) and net capital accumulation (Δk) is savings ($S=sy$) minus compensation for labour force growth (nk) such that,

$$(3) \quad \Delta k = sy - nk, \quad 0 < s < 1,$$

Combining (1) and (2) one can derive the growth rate of capital and output per worker, such that,

$$(4) \quad g_k = sAk^{a-1} - n \quad \text{and} \quad g_y = ag_k.$$

In steady state, $g_k = g_y = 0$.

A.2. The AK-model

The AK-model assumes all types of capital are reproducible such that,

$$(5) \quad y = Ak,$$

where $k=K/L$ as in A.1. but K represents a broad measure of capital (i.e., composite of capital and labour). Note that the model is the same as in (1) for $a=1$. The production exhibits constant returns to scale but not diminishing marginal returns to capital. This can be achieved through a compensation of the diminishing marginal productivity of capital by increasing quality or variety of machinery. Research and development are necessary to get this variety and firms use skilled labour to produce it. To ensure that the inputs produced by R&D are recuperated, it is assumed that firms are in monopolistic competition (see Grossman and Helpman, 1991, and Romer, 1990). It can be shown that using the accumulation of capital equation (3), the steady state rate of growth of capital per worker is,

$$(6) \quad g_y = g_k = sA - n,$$

which implies that for $sA > n$, positive constant over time, capital per worker can grow without bound.

A.3. The growth model with endogenous labour

The other approach is to consider that labour is endogenously determined. Households save by investing in human capital and in physical capital (Lucas, 1988, Mankiw et al. 1992). The production function is very similar to Solow's with human capital endogenous. Hence,

$$(7) \quad y = k^a h^{1-a}$$

with y and k , output and capital per worker and h , human capital per worker. A fraction s of output is saved for capital accumulation,

$$\Delta k = sy, \quad 0 < s < 1,$$

and a fraction q , to increase human capital quality,

$$\Delta h = qy \quad q > 0.$$

In steady state, y , k and h grow at the same rate which is determined by the savings rate s and the propensity to invest in human capital, q . If r is the ratio of human to physical capital (K/H) their respective long-run growth rates are,

$$(8) \quad g_k = sr^{1-a} \quad \text{and} \quad g_h = qr^{-a},$$

which are equal. Then,

$$r = q/s.$$

and through the equilibrium definition for r , the growth rates of physical capital and output per worker are given by,

$$(9) \quad g_k = sr^{1-a} = s^a q^{1-a} = g_y.$$

The major implication of this equation is that both savings rates have growth rate effects and not just level effects.

A.4. The AK-model with financial intermediation

Using the AK model,

$$(10) \quad y = Ak,$$

where $k=K/L$ as in A.2. and introducing the financial intermediation through the savings function. It is assumed that a proportion $(1-f)$ of saving is lost and, thus, only a proportion f of total saving is used for investment, such that,

$$(11) \quad I = jS = j sY$$

Then, the growth rate of capital and output is given by,

$$(12) \quad g_k = g_y = j sA - n$$

which differs from (6) by the fact that only a fraction f of savings contributes to the growth rate of capital and output and it is quite obvious that the *direct* impact of financial intermediation would be through a decrease in the leakage of savings (f) (see Pagano, 1993).

A.5. Summary

Below is a table, which allows for a direct comparison of the outcomes of the various models on capital and output growth per worker.

Table 1: Main features of the growth models

	Output per worker production function ($y=Y/L$)	Capital per worker growth rate (g_k) in steady state	Output per worker growth rate (g_y) in steady state
1. The Solow model	$y=Ak^a \quad a < 1$ $I=sY$ with $1 > s > 0$	$sAk^{a-1}=n$	$g_k=0$
2. The AK-model	$y=Ak$ $I=sY$ with $1 > s > 0$	$sA-n$	g_k
3. Endogenous human capital	$y=k^a h^{1-a}$ $I=sY, I^h=qY$ with $1 > s > 0, 1 > q > 0$	$s^a q^{1-a}$	g_k
4. The AK-model with financial intermediation	$y=Ak$ $I=fsY$ with $1 > s > 0, 1 > f > 0$	$fsA-n$	g_k

In all models, but the Solow growth model, a change in the savings rate affects permanently the rate of growth of capital and output per worker. When financial intermediation is introduced in the endogenous growth model, additional transmission channels work through the financial market to growth.

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Figure 1: Savings Ratio and Output Growth, 1971-1997.

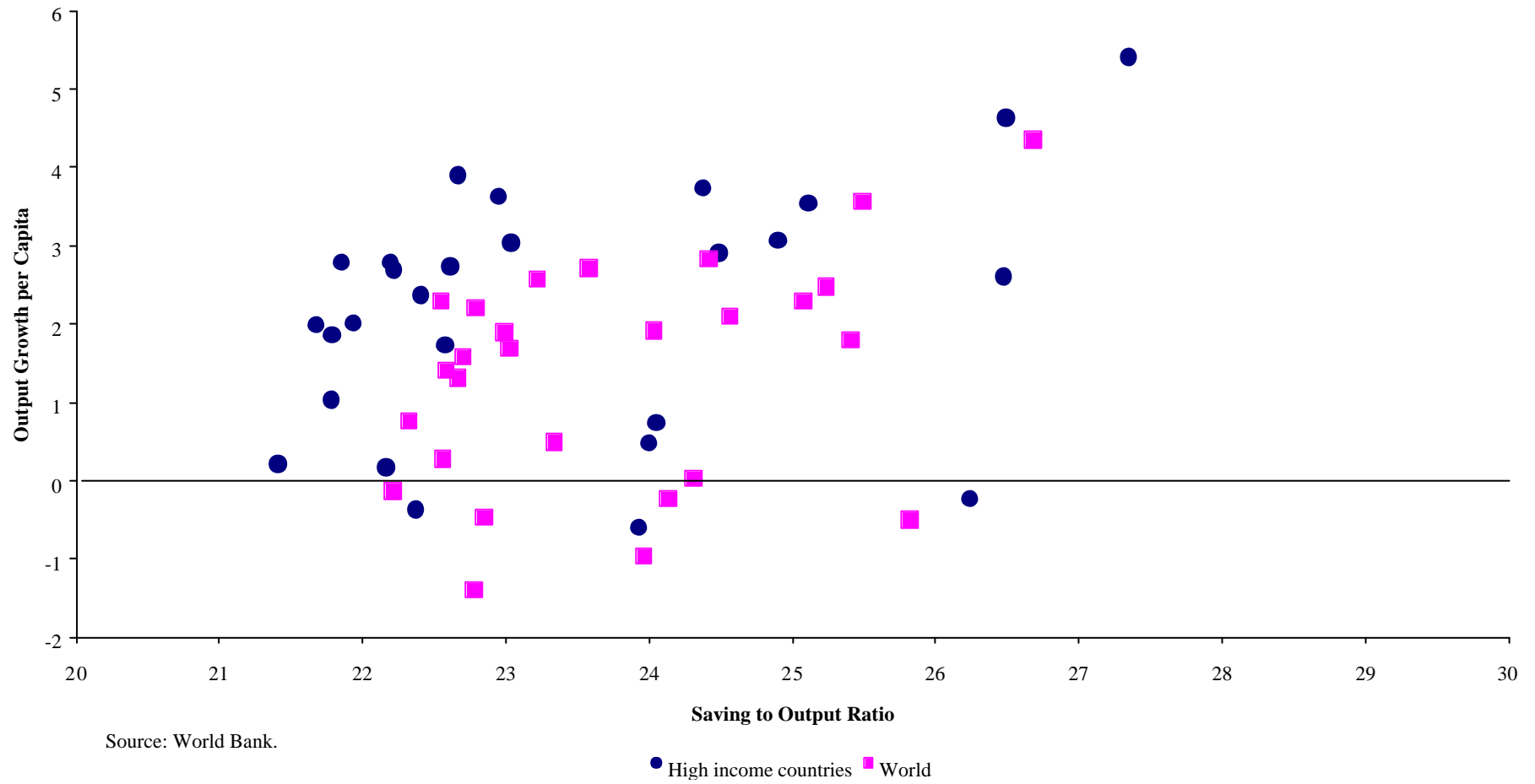


Figure 2: The Roles of Financial Intermediaries

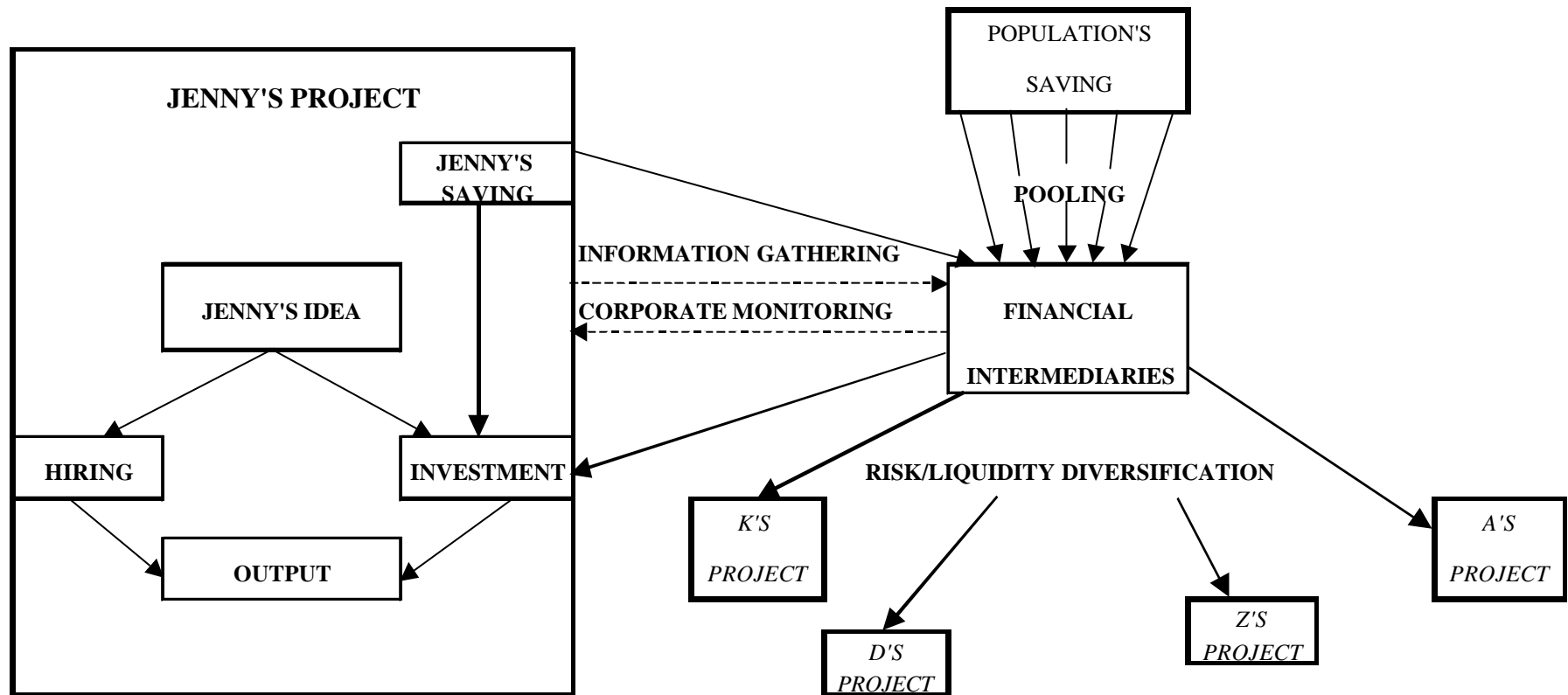


Figure 3: Self-employment and Output Growth (averages 1990-1994)